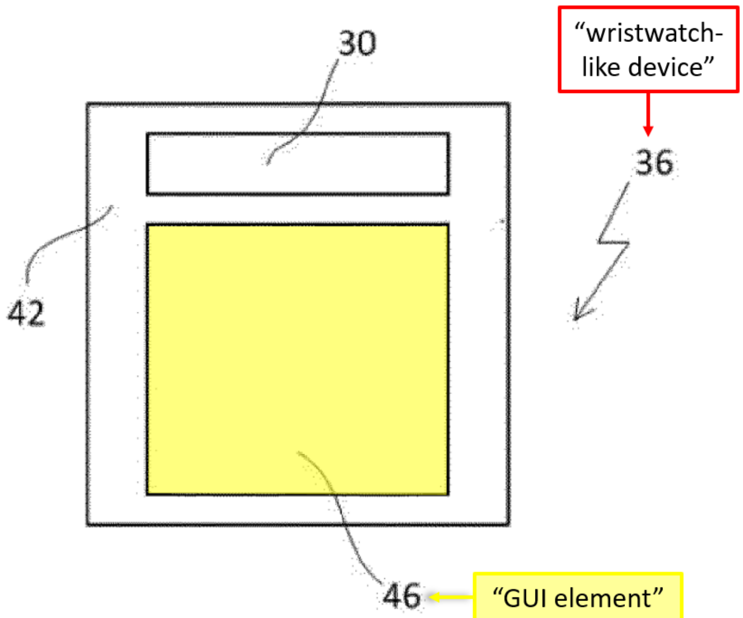
interaction between the system 34 and the user." EX1009 16:6–7; EX1020 13:33–34.



See EX1009 at 28; EX1020 at 25 (Fig. 4A). This can be "in the form of a **touch screen**, which enables easy device-user-interaction." EX1009 8:14–15; EX1020 6:4–5 (emphasis added). The GUI element enables use "as a smart watch" to display the "internet, SMS (Short Message Service)" or other services. EX1020 14:7–10; EX1009 16:14–17. EX1003 ¶¶199–201.

A POSITA would have been motivated to incorporate a touchscreen in Kotanagi as it reduces the need to provide buttons on the front side of Kotanagi's device, increase the size of Kotanagi's screen (without expanding device size), reduce the number of separate components and moving parts in Kotanagi's device

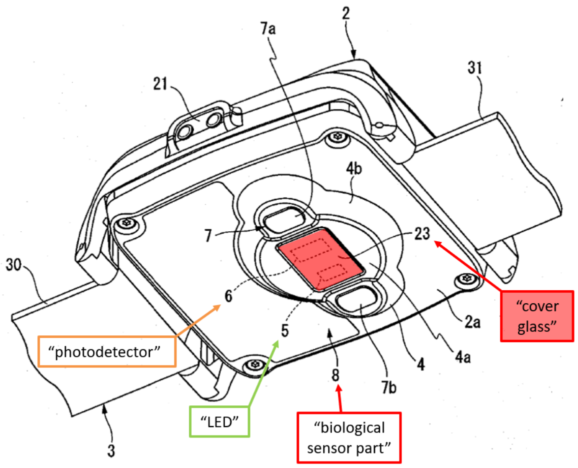
(reducing mechanical failure risk), and provide additional functionality not enabled by hardware buttons alone (a touchscreen or virtual "buttons" can be programmed for varying situations and functions, while the larger screen can provide context for these situations and functions). Further, touchscreens were known in the art,[14] and this combination provides "familiar elements" that do "nothing more than yield predictable results." *See KSR,* 550 U.S. at 416. EX1003 ¶202.

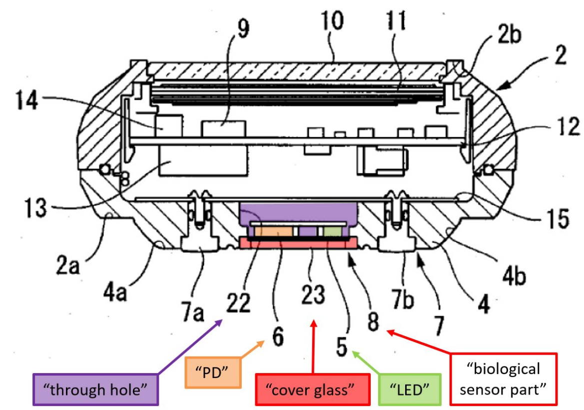
c. **[16c] "a rear cover positioned at least partially within a rear opening defined along a rear portion of the housing, the rear cover defining at least a portion of a rear exterior surface of the wearable electronic device and having an optically transparent portion;"**

Consistent with the discussion of limitation **[1f]**, Kotanagi teaches a rear cover glass 23 within and closing off "through-hole 22" to define a portion of the rear exterior surface:

---

[14] *See* EX1041 [0020] (biosensing watch with a "touch screen display"); EX1016 [0046] (biosensing watch with "touch sensitive screen inputs"); EX1011 [43]–[44] (biosensing watch with a "touch display").

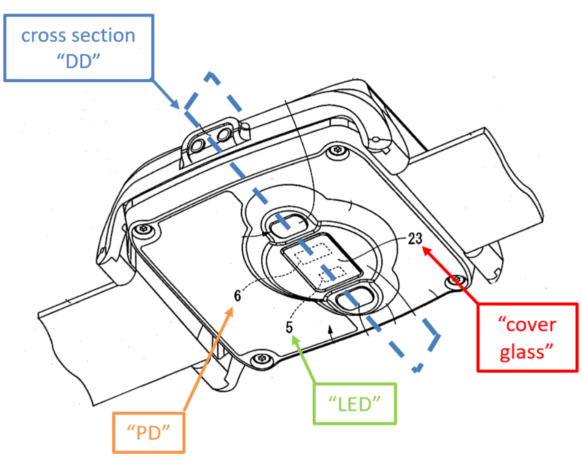


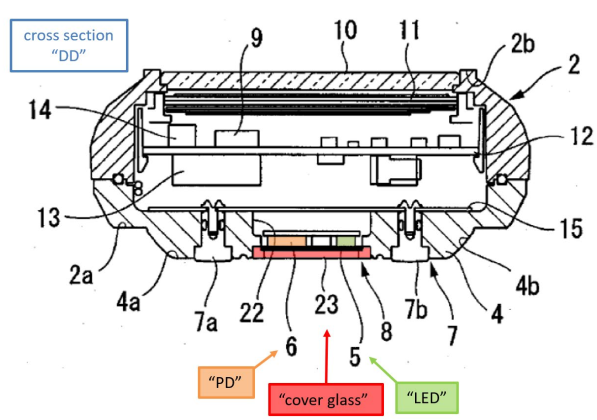


See EX1005 at 26, 27 (Figs. 5 and 7). Kotanagi's cover glass 23 is optically transparent because it allows the LED 5 to emit light toward the living body, and through it, the photodetector 6 receives "reflected light corresponding to the pulsation of arteries." *Id.* ¶65. EX1003 ¶¶203–204.

d. [16d] "an optical sensor positioned within the housing and configured to emit an optical signal through the optically transparent portion;"

Kotanagi's LED "touch[es] the inside of the glass cover 23." EX1005 ¶55.

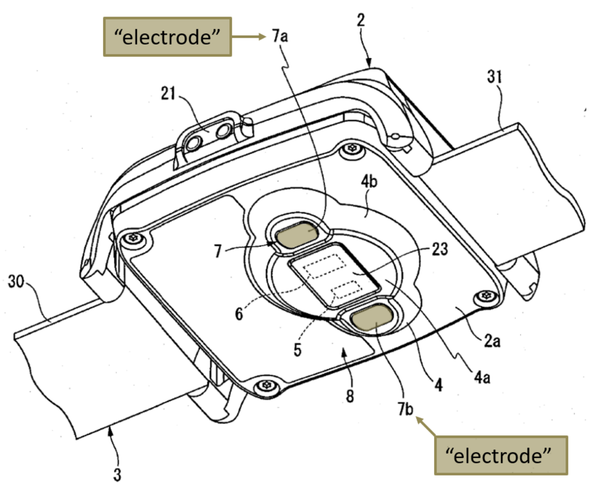




See EX1005 at 26, 27 (Figs. 5 and 7). Consistent with the explanation of limitation **[1h]** and dependent Claim 6, this LED emits through the cover glass. *See* EX1005 ¶46. EX1003 ¶¶205–206.

e. [16e] "a first electrode positioned along the rear exterior surface of the wearable electronic device; a second electrode positioned along the rear exterior surface of the wearable electronic device; and"

As noted for limitation **[1i]**, Kotanagi's rear electrodes 7a and 7b detect skin contact using a "potential difference" between them. EX1005 ¶59.



See id. at 26 (Fig. 5). EX1003 ¶207.

f. [16f] "a third electrode positioned along a side of the wearable electronic device, wherein:"

As shown for limitation **[1j]**, Kotanagi in view of Coppola teaches a third

electrode on the side of the wearable device. EX1003 ¶¶208–214.

g. [16g] "the wearable electronic device is configured to measure a first physiological parameter using the optical sensor; and"

As shown for limitation **[1k]**, Kotanagi teaches a pulse rate measurement with its optical sensor. EX1003 ¶215.

h. [16h] "the wearable electronic device is configured to measure a second physiological parameter using the first electrode, the second electrode, and the third electrode."

As shown for limitation **[1l]**, Kotanagi in view of Coppola teaches an ECG measurement with a first, second, and third electrode. Thus, a POSITA would have found it obvious to measure a second physiological parameter, such as an ECG, with a first, second, and third electrode. EX1003 ¶216.

i. Motivation to Combine Kotanagi and Coppola

A POSITA would have been motivated to combine Kotanagi and Coppola, and expected success, for the reasons stated above in § IV(A)(1)(m). Further motivations are provided throughout this petition. EX1003 ¶217.

11. Dependent Claim 17

Claim 17 depends from Claim 16 and adds **"the first electrode, the second electrode, and the third electrode are part of an electrocardiograph sensing**

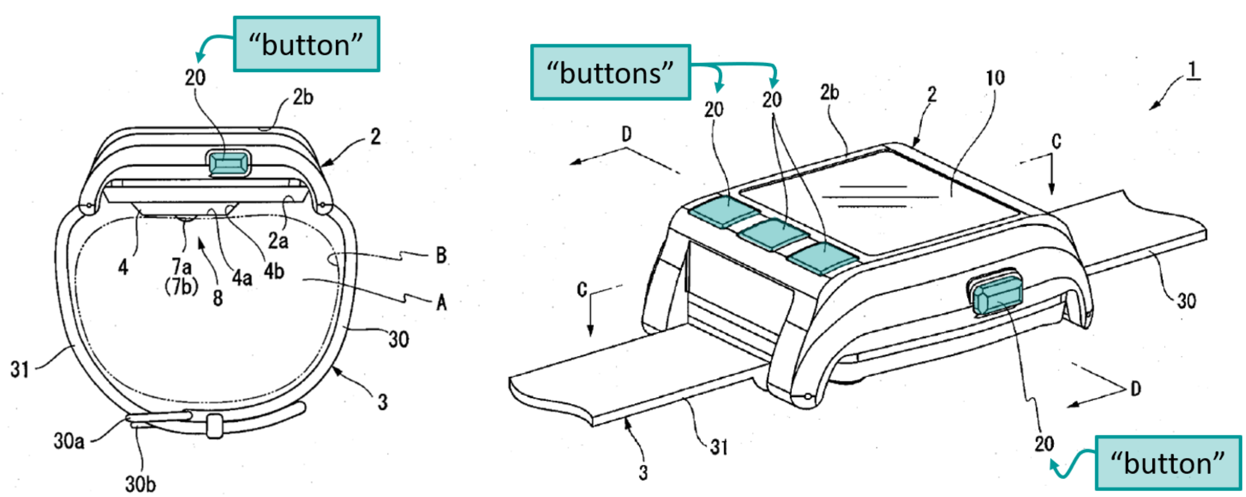
system; and the second physiological parameter is an electrocardiogram."

These limitations are obvious based on the analysis for limitations **[1l]**, **[2c]** and **[2d]**, as Kotanagi in view of Coppola teaches the measurement of an electrocardiogram with a first, second, and third electrode. An electrocardiogram is measured with an electrocardiographic sensing system. Thus, a POSITA would have found that Kotanagi in view of Coppola teaches these limitations. EX1003 ¶219.

12. Dependent Claim 18

Claim 18 depends from Claim 16 and adds **"further comprising an input device positioned along a side of the housing and configured to receive at least one of a rotational input or a translational input."**

As shown for Claims 3 and 5 above, Kotanagi teaches a translational input device (button 20) on the side of the housing. EX1005 ¶52.



See EX1005 at 24, 25 (Figs. 2 and 4). EX1003 ¶221–223.

13. Dependent Claim 19

Claim 19 depends from Claim 16 and adds **"wherein the rear cover defines a convex exterior surface."**

As shown for Claim 11, Kotanagi teaches a rear cover that defines a convex exterior surface. EX1003 ¶225.

14. Dependent Claim 20

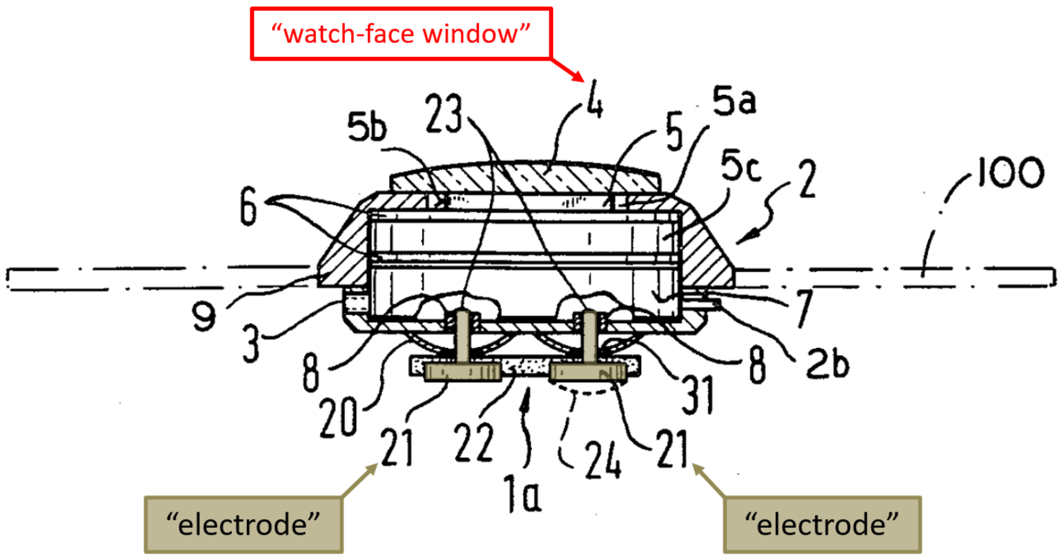
Claim 20 depends from Claim 16 and adds **"wherein the optical sensor comprises: an optical emitter configured to emit the optical signal through the optically transparent portion; and an optical receiver configured to receive a reflected portion of the optical signal through the rear cover."**

These limitations are obvious based on the analysis for Claim 6, including the figure (elements positioned to transmit through cover glass 23). EX1003 ¶227.

I. Ground 2: Claims 1–3, 5–6 and 10–14 are unpatentable because they would have been obvious over Kotanagi in view of Schmid.

This Ground applies Kotanagi identically to the analysis provided above in Ground 1 for Claims 1–3, 5–6 and 10–14, except that Schmid is used to teach a third electrode (limitations [1j], [10i]) in order to measure a second physiological parameter (limitations [1l], [10k]), namely an electrocardiogram (e.g., claims 2, 13). EX1003 ¶228.

Schmid, which was published in 1983, teaches a "heart-frequency measuring assembly" in a "wristwatch housing or case and which contains the electrodes in an electrode set or a plurality of such electrode sets." EX1029 5:3–7.



See EX1029 at 2 (Fig. 1). Schmid teaches significant benefits for EKG measurements using such a device. These include analyzing and diagnosing heart conditions, and monitoring cardiac activity. EX1029 1:14–16, 2:5–9. A POSITA would have found it obvious to enhance Kotanagi's biosensing features with EKG measurements to provided the added benefits explained in Schmid. EX1003 ¶¶229–230.

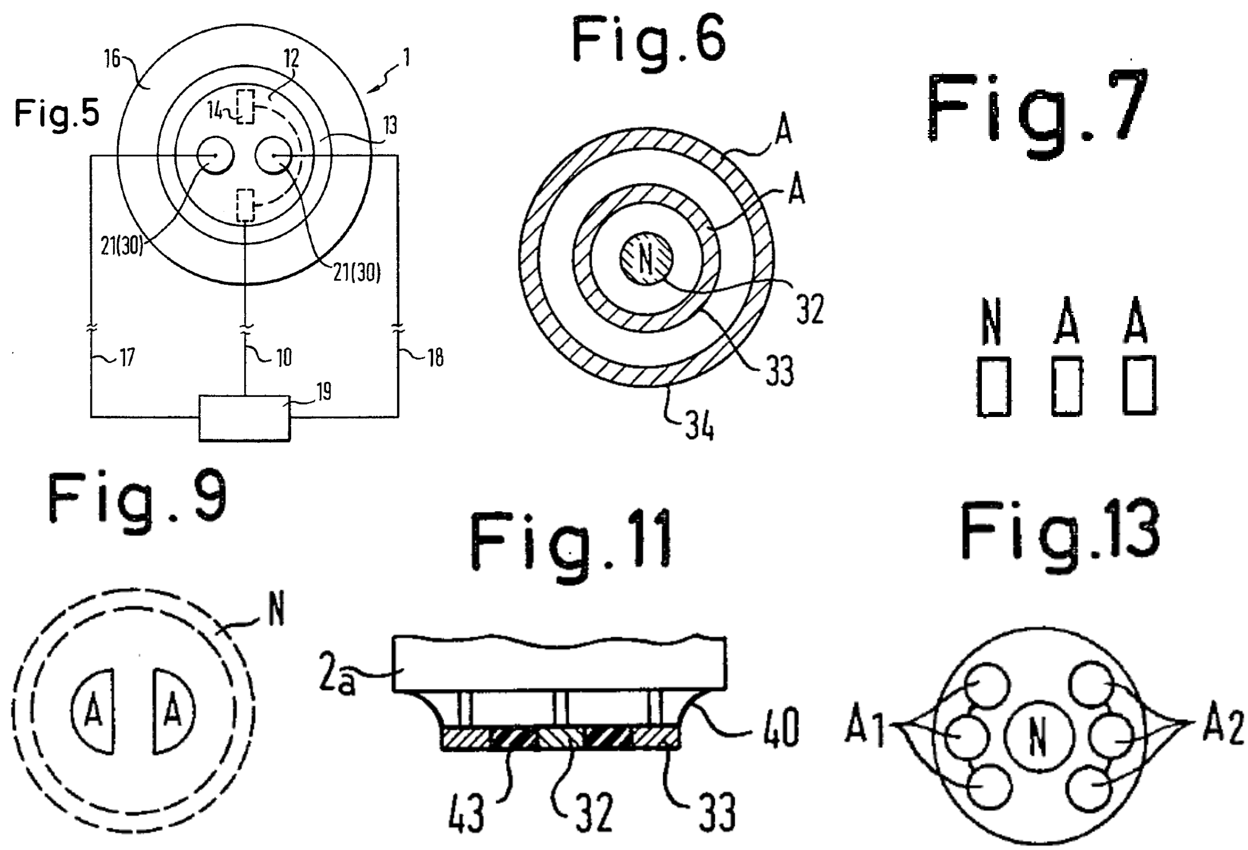
Schmid teaches that two closely-spaced electrodes and a third, reference electrode can be used for EKG measurement:

> According to the invention as described, two electrodes

> (measurement or input electrodes) and the neutral or reference electrode can be disposed in close proximity with measurement results which nevertheless are at least as precise as the electrodes heretofore used for EKG measurements inspite [sic] of the many times greater spacing employed with the conventional electrodes.

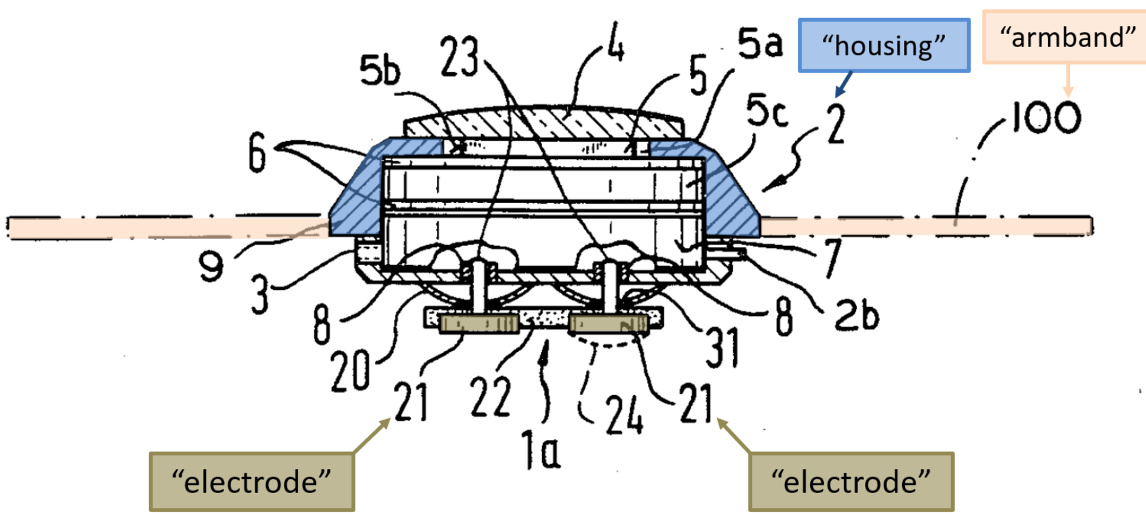
EX1029 4:15–22.

Schmid further shows in figures 5–13 that active electrodes (“A” or “33” and “34”) and a neutral (ground) electrode (“N” or “32”) may be arranged in “various configurations” (EX1029 6:36), some of which are shown below:



Id., Figs. 5, 6, 7, 9, 11, 13. EX1003 ¶¶231–232.

The reference electrode can be formed by "[t]he armband 100 and/or the housing 2" (EX1029 5:20–22), in which case "ring 13 can be … dispensed with entirely." EX1029 8:24–26. Because the housing forms the side of the watch, which connects to the armband, putting the reference electrode in either place locates a third electrode at the watch side, as claimed. The figure below shows how the housing 2 and armband 100 are located at the side of the watch.



See EX1029 at 2 (Fig. 1).

Thus, a POSITA would have found obvious an EKG measurement with three electrodes, including a third neutral or reference electrode on the side of the watch, in view of Kotanagi and Schmid. EX1003 ¶¶233–234.

a. Motivation to Combine Kotanagi and Schmid

Prior to September 2014, a POSITA would have been motivated to combine Kotanagi and Schmid as they are in the same field of endeavor of biosensing watches. This person would have expected to succeed in adding a third electrode because, for example, Kotanagi already teaches electrodes to measure an electrical potential and that "the electrodes need not be a pair, and a plurality of electrodes, for example, may be provided so that contact can be detected based on the potential difference between each of the electrodes." EX1005 ¶14. *See Id.* ¶86 (plurality of electrodes).

In view of Schmid and the many three-electrode biosensor watches (e.g., *supra* note 8), a POSITA would have also expected success and found it obvious to provide three electrodes in Kotanagi's watch at least to: 1) analyze and diagnose heart conditions and monitor cardiac activity (EX1029 1:14–16, 2:5–9); 2) improve signal to noise (e.g., *supra* note 9) ratio with backup or duplicate measurements; 3) provide additional sensors as a failsafe if one stops working; 4) provide multiple contact points that are easier to access; 5) allow for different measurements (EKG and skin conductance) to enhance the features and datatypes available to the user; 6 provide a reference electrode to measure the voltage between the two other

conductive areas; and/or 7) provide additional contact points for continuous[15] skin contact during EKG measurements as the watch is bumped, shifted, or jostled (such as during exercise). A POSITA would have expected success in adding an electrode to the side based on many similar, known watch electrode arrangements.[16] EX1003 ¶¶235–236.

Schmid teaches EKG measurement via electrodes disposed in "close proximity" and which "are at least as precise as the electrodes heretofore used for EKG measurements inspite [sic] of the many times greater spacing employed with the conventional electrodes." EX1029 4:17–22. Thus, a POSITA would have been motivated to use Schmid to utilize a compact EKG configuration. EX1003 ¶237.

A POSITA would have expected success because the configurations of electrodes in Schmid and Kotanagi are very similar:

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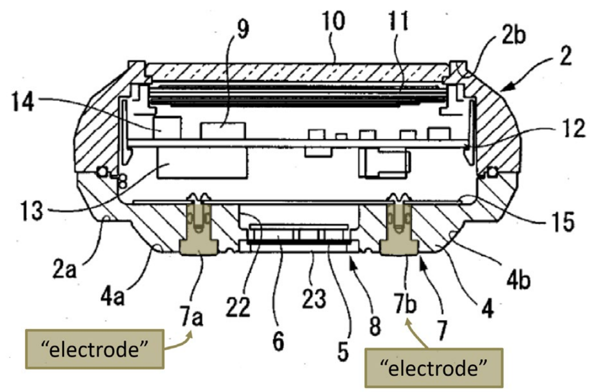
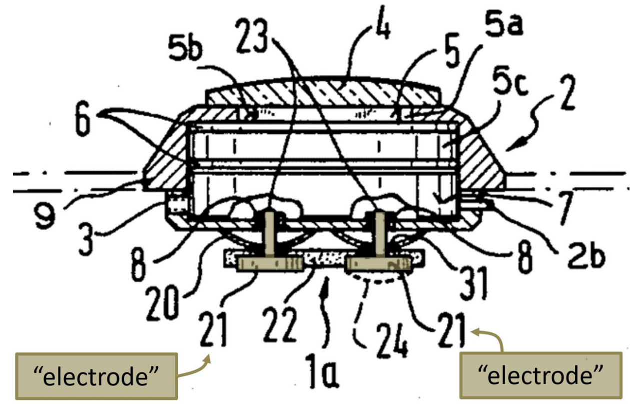
[15] *See supra* n. 10.

[16] *See* EX1008 at 19 (Claim 15, three configurations); EX1027 Fig. 2 (electrodes in top, bottom, band); EX1029 at Figs. 1, 5–13 (electrodes N, A, A1, A2, 13, 32–34); EX1030 Figs. 1, 2 (electrodes 4a and 4b); EX1031 Fig. 1 (electrodes 14, 16, and 18); EX1033 Fig. 5 (conductive areas 515, 560 and 561); EX1034 [0237] (electrode on band, back); EX1035 Figs. 2a, 2b (electrodes 122, 124, 126); EX1008 Figs. 1a, 1b (electrodes 16, 15).

Kotanagi	Schmid
 *See* EX1005 at 27 (Fig. 7).	 *See* EX1029 at 2 (Fig. 1).

Both have two skin-contact (measurement) electrodes on the rear watch surface. A POSITA would have found it simple and feasible to embed an electrode in the existing housing or armband of Kotanagi. EX1003 ¶¶238–239.

This motivation applies equally to all the claims rejected under Ground 2, as Schmid is applied instead of Coppola to teach a third electrode on the side of the watch for an ECG measurement in claims 1–6, 8, and 10–14. Further motivations are provided throughout this petition. EX1003 ¶240.

J. Ground 3: Claim 4 is unpatentable because it would have been obvious over Kotanagi in view of Coppola and Tran

15. Dependent Claim 4

Claim 4 depends from Claim 1 and further adds **"wherein the second physiological parameter is a galvanic skin response."**

Kotanagi's "pair of electrodes 7a and 7b" use a current to measure whether

the watch is in contact with the user's skin based upon a "potential difference" (or voltage, V) between the electrodes. EX1005 ¶59.

Tran teaches that a two-electrode skin measurement also provides skin conductance, or galvanic skin response ("GSR"), based on a simple calculation using a known value. EX1034 [0034], [0280]. Tran is highly analogous to Kotanagi, teaching a housing with "bioelectric contacts," e.g., for a "wristwatch." *Id*.

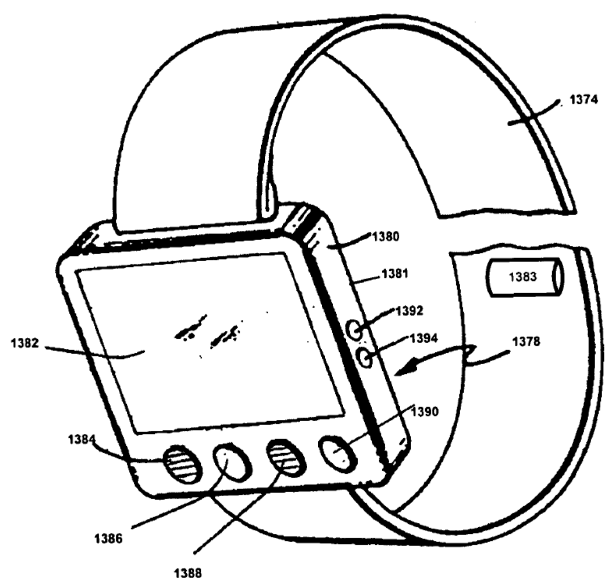


FIG. 6A

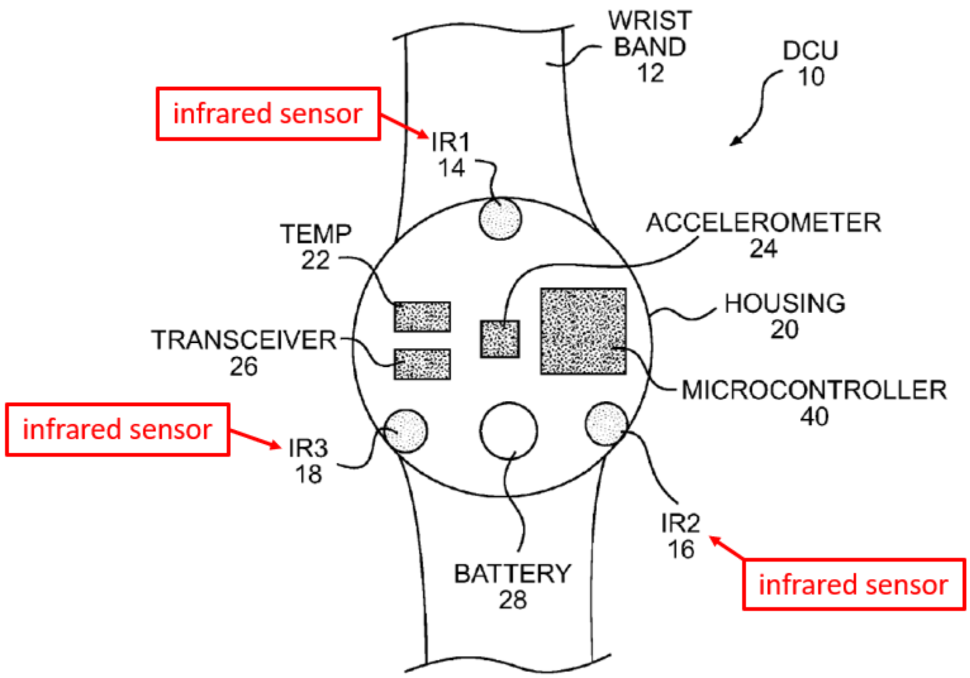
EX1034 at 5. Like Kotanagi, Tran teaches "two electrodes on the wrist watch" to measure a "voltage signal from the surface of the body," but it does so "in terms of impedance." *Id*. [0260]. Tran teaches that one or more Galvanic Skin Response (GSR) sensors use electrodes to measure and "calculate the skin resistance." EX1034 [0280]. EX1003 ¶¶242–244.

A POSITA would have known how impedance (resistance, or R, in a DC circuit) relates to voltage through Ohm's law, I=V/R, and this law is also stated in Tran: "Ohm's Law: current in a circuit is directly proportional to voltage and inversely proportional to resistance in a DC circuit." EX1034 [0259] Because Kotanagi's device measures voltage between its electrodes (EX1005 ¶59), a current (I) would have been known or readily discoverable. A POSITA would have understood from Tran that galvanic skin response simply measures skin conductance (measured using resistance), a simple measurement to make using Kotanagi's existing skin-electrode circuit. Thus, based on Tran, a POSITA would have simply divided Kotanagi's existing potential difference measurement (V) by the known current (I) to calculate the skin resistance, or GSR, between its two electrodes, without making any modifications to Kotanagi's existing two-electrode structure. EX1003 at ¶245.

K. Ground 4: Claim 15 is unpatentable because it would have been obvious over Kotanagi in view of Coppola and further in view of Kateraas.

Claim 15 depends from Claim 10 and adds **"wherein the rear cover comprises sapphire."**

Like Kotanagi, **Kateraas** (EX1014), which published in 2012, describes a biosensing wristwatch:



See EX1014 at 2 (Fig. 1).

Kateraas teaches that sapphire can form a "window" of "infrared transmissive or transparent material . . . to allow radiation emitted from infrared sensors 14, 16, and 18" to pass out of the device and "impinge upon the underside of the user's wrist" and allow "infrared radiation reflected or emitted from the user's skin" to pass into the device via the sapphire window. EX1014 [0059]. "Such infrared transmissive or transparent materials" for the window "may include, e.g., germanium, zinc selenide, **sapphire**, IR glass, IR polymer, barium fluoride, calcium fluoride, and combinations thereof." *Id.* (emphasis added). EX1003 ¶247–248.

a. Motivation to Combine Kotanagi, Coppola, and Kateraas

The ’483 patent explains that “cover glass” is a term of art and is often used generically, “regardless of the material.” EX1001 23:26–29. Accordingly, a POSITA would have considered various materials for the rear cover based on the ’483 patent’s use of this generic phrase. Because Kotanagi’s optical sensor features are intended to emit and receive similar radiation, to the same anatomical portion (wrist), for the same pulse sensing purpose taught by Kateraas, a POSITA would have looked to Kateraas for useful window materials and expected success in using sapphire for the cover glass 23. EX1003 ¶249.

Prior to September 2014, a POSITA would have been motivated to provide a sapphire rear cover, and expected success, because Kotanagi and Kateraas both teach light emission and reflection on the underside of a watch to measure the pulse rate of a user. Kotanagi teaches LED 5 for generating light and PD (Photodetector) 6 for receiving a pulse signal. EX1005 ¶46. Kateraas likewise teaches that “infrared sensors 14, 16, or 18 may provide robust data from which accurate pulse readings may be determined.” EX1014 [0032]. Further, Kateraas teaches that the cover of a biosensing module may include “sapphire, IR glass, IR polymer…” EX1014 [0059]. Since Kotanagi teaches cover glass 23 as a covering for a biosensor module, a POSITA would have found glass and sapphire obviously substitutable in view of the list of materials in Kateraas. Such a substitution would

have been a mere combination of familiar elements according to known methods that do no more than yield predictable results. *See KSR* at 416. EX1003 ¶250.

L. Ground 5: Claim 7 is unpatentable because it would have been obvious over Kotanagi in view of Coppola or Schmid and further in view of Fraser.

16. Dependent Claim 7

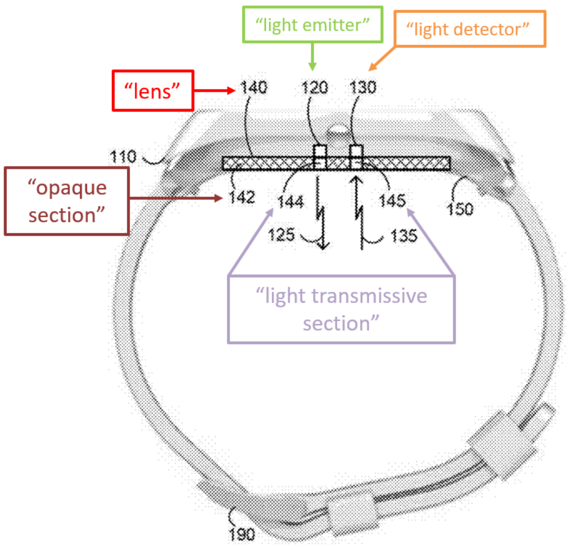
Claim 7 depends from Claim 1 and adds **"wherein: the optical emitter is a first optical emitter configured to emit light having a first wavelength; and the optical sensor further comprises a second optical emitter configured to emit light having a second wavelength different from the first wavelength."**

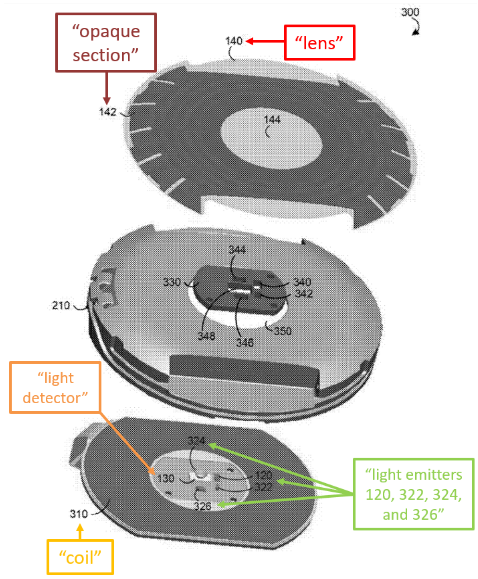
Grounds 1 and 2 both use Kotanagi to demonstrate how Claim 1 is unpatentable, but for the third (ECG) electrode and related teachings, Ground 1 uses Coppola and Ground 2 uses Schmid.

This Ground applies Kotanagi, Coppola, and Schmid identically to the analyses provided above for Claim 1 under both Grounds 1 and 2. However, it adds the teachings of Fraser to Kotanagi for the further limitations of dependent Claim 7.

Kotanagi teaches an LED optical emitter, and in the same field of endeavor Fraser teaches that the skin-facing side of a biosensing watch may be used for

"photoplethysmography, pulse oximetry, and other biometric sensing" using an array of light emitters (120, 322, 324, 326). EX1041 [0016], [0027].





See EX1041 at 2, 4 (Figs. 1, 3).

Fraser teaches emitting different wavelengths via "a combination of red, infrared, and green light emitters." EX1041 [0015]. Accordingly, Fraser teaches a red light emitter 120, an infrared light emitter 322, and two green light emitters 324 and 326. *Id.* [0024]. By using different wavelengths, the watch may probe different physiological parameters: "red and infrared light emitters can be used to detect blood oxygen saturation and a green light emitter can be used to detect heart rate." *Id.* [0015]. At least by September 2014, based on Fraser's disclosure, a POSITA would have been motivated to further modify Kotanagi (even after any modifications taught by Coppola or Schmid), to include a second optical emitter, to improve its optical sensing features (e.g., to determine blood oxygen saturation in

addition to pulse rate). Kotanagi already has a transparent cover facing the skin, with room to place additional small emitters near the existing optical components on the cover glass 23. EX1003 ¶¶252–255.

a. Motivation to Combine Kotanagi and Fraser

A POSITA would have wanted to combine Fraser with Kotanagi for various reasons. Both teach biosensing watches with similar shapes and rear biosensors. Kotanagi teaches the benefits of biosensing by determining pulse rate. Use of multiple wavelengths in a biosensing watch (as taught by Fraser) allows probing of additional physiological parameters. This is consistent with, and a natural extension of, Kotanagi's biosensing goals. A POSITA would have expected success because, like Kotanagi, Fraser teaches that its "wrist worn device" may be used to measure "heart rate" via a photoplethysmography measurement. EX1005 ¶1; EX1041 [0015]–[0016]. By September 2014, a POSITA would have known that additional biometric data (e.g., how well the lungs are working to insert blood into the blood stream) is much more helpful than simply knowing how quickly the heart is beating—especially if the blood it is circulating does not have sufficient oxygen. Gaining this significant medical information would have been a strong reason to add one or more new emitters (e.g., red and green, as taught by Fraser.) EX1041 [0015]. Thus, a POSITA would have been motivated in September 2014 to add at least one LED, or use the color emitters of Fraser, to additionally measure

blood oxygen saturation. Further, multiple emitters can aim or emit differently, they can work together to increase signal strength, etc. A POSITA would have found multiple emitters desirable for all these reasons. EX1003 ¶256.

Fraser also teaches, like Kotanagi, that its biosensing watch may be charged in a "contactless" or wireless manner. EX1005 ¶53, EX1041 [0026]. This similarity would have added to the expectation of success by a POSITA in combining them. For example, Fraser shows how wireless charging structures can be coiled around optical elements and provide desired functionality despite being closely adjacent to the optical elements. EX1003 ¶257.

b. Motivation to Combine Coppola with Kotanagi and Fraser

Ground 1 provides reasons for combining Kotanagi and Coppola. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with placing one or more different-wavelength LEDs in the rear as taught by Fraser. Indeed, the same motivation—improving sensing capabilities—would animate both modifications and they are fully compatible. EX1003 ¶258.

c. Motivation to Combine Schmid with Kotanagi and Fraser

Ground 2 provides reasons for combining Kotanagi and Schmid. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with placing one or more different-wavelength LEDs in

the rear as taught by Fraser. Indeed, the same motivation—improving sensing capabilities—would animate both modifications and they are fully compatible.

Thus, a POSITA would have found obvious the combination of Kotanagi's LED and Fraser's multiple-wavelength light emitters in view of the teachings above. EX1003 ¶¶259–260.

M. Ground 6: Claim 9 is unpatentable because it would have been obvious over Kotanagi, Coppola or Schmid, and further in view of Honda.

Claim 9 depends from Claim 1 and adds **"further comprising a wireless charging system configured to receive power wirelessly, from an external charging dock, through the rear exterior surface of the wearable electronic device."**

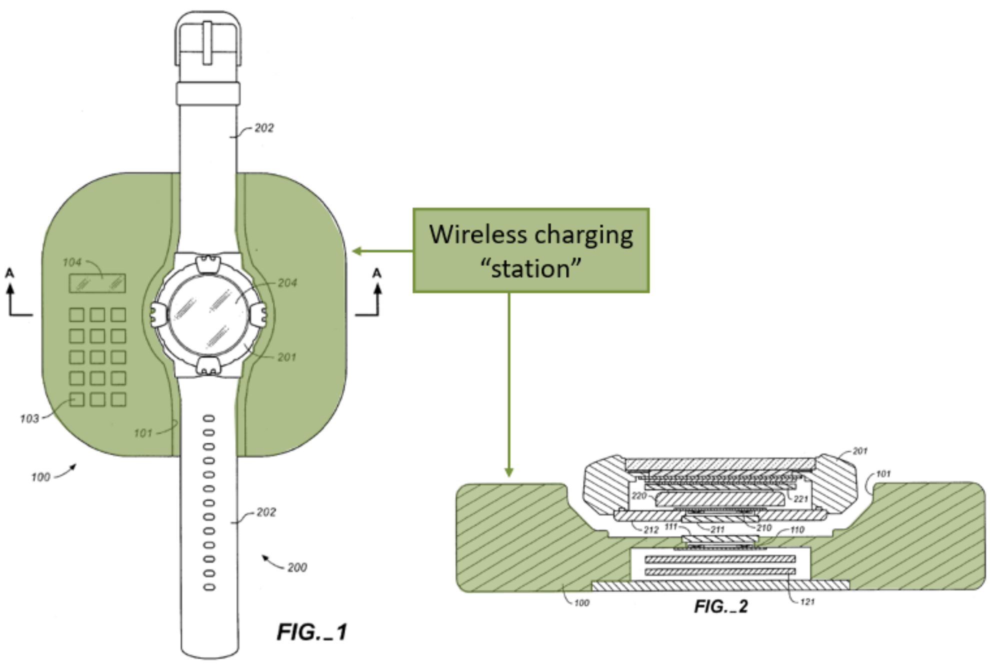
Grounds 1 and 2 both use Kotanagi to demonstrate how Claim 1 is unpatentable, but for the third (ECG) electrode and related teachings, Ground 1 uses Coppola and Ground 2 uses Schmid.

This Ground applies Kotanagi, Coppola, and Schmid identically to the analyses provided above for Claim 1 under both Grounds 1 and 2. However, it adds the teachings of Honda to Kotanagi for the further limitations of dependent Claim 9.

Kotanagi teaches that instead of a wired connection terminal for charging, "a transformer or the like for supplying power to a recharger and to the inside of the

housing 2 may be provided so as to recharge the rechargeable battery 13 in a contactless state." EX1005 ¶53. A POSITA would have known at the time of the '483 Patent's filing that such a transformer for contactless charging typically takes the form of an external charging dock. EX1003 ¶262–264.

Honda, which issued in 2001, discloses such a charging dock (or station) for a biosensing wristwatch. Honda's figures show plan and cross-section views:



See EX1006 at 2–3 (Figs. 1, 2). Like Kotanagi, Honda teaches a biosensor: "the electronic watch 200 detects biological information including the pulse rate or the heart rate of the body." EX1006 6:17–20. Like Kotanagi, the Honda watch has a "cover glass" over an opening in the bottom face of the watch. *Id.* 6:24–25. These similarities increase a POSITA's expectation of a successful combination. EX1003 ¶¶265–266.

Honda teaches inductive coupling of a charging station coil and a watch coil:

> When the electronic watch 200 is placed onto the station 100, the station-side coil 110 and the watch-side coil 210 are physically out of contact with each other, but magnetically coupled with each other because the surfaces of coil winding of both coils are generally in parallel to each other.

EX1006 6:36–40.

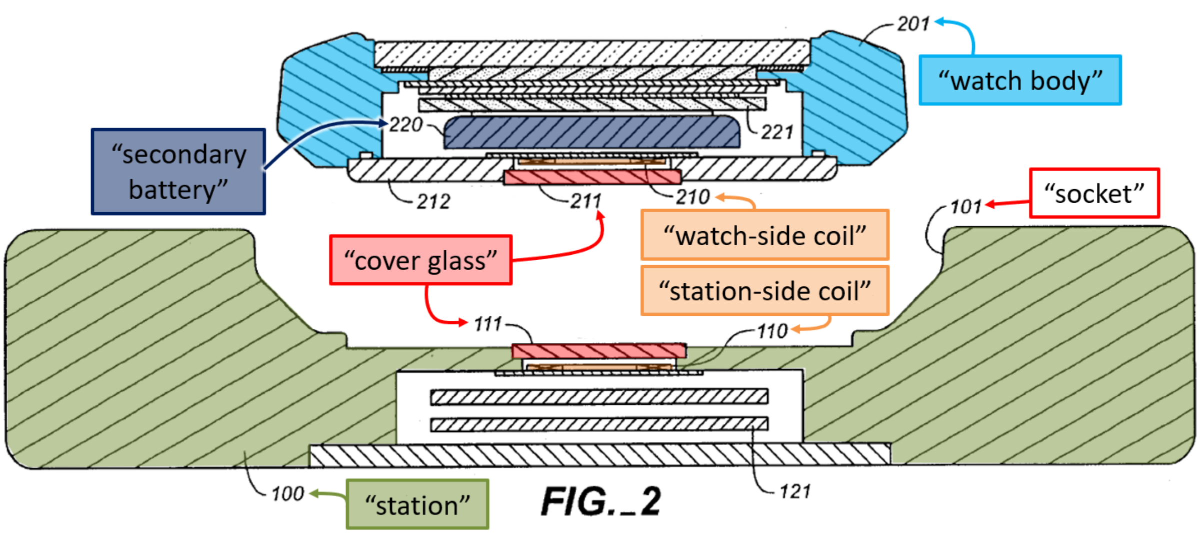


FIG._2

See id. at 3 (Fig. 2). This creates magnetic flux that induces current in the watch-side coil and charges the watch battery. EX1003 ¶267.

Given Honda's teaching of a wireless receive coil near a rear opening similar to that taught in Kotanagi (where both Honda's and Kotanagi's openings have a cover glass), a POSITA would have used Honda's teachings to either: 1) modify Kotanagi to position a wireless charging coil behind Kotanagi's cover glass, LED, and PD; or 2) enlarge Kotanagi's opening and cover glass to make room for a coil behind the cover glass, surrounding the LED and PD. In either

case, the result would be a wireless charging system configured "to receive power wirelessly, from an external charging dock, through the rear exterior surface of the wearable electronic device," as claimed. EX1003 ¶268.

a. Motivation to Combine Kotanagi and Honda

Kotanagi and Honda are both assigned to Seiko companies. *See* EX1005 at 1, EX1006 at 1. Thus, a POSITA having Kotanagi would have also readily identified Honda and considered the two references together. Prior to September 2014, a POSITA would have been motivated to make the modifications explained above based on teachings of both Kotanagi and Honda and would have had a reasonable expectation of success in doing so. Kotanagi teaches a pulse rate biosensor watch that may be charged in a "contactless state" (EX1005 ¶53), motivating a POSITA to look to Honda for what modifications to include to achieve this kind of charging. Honda teaches wireless watch charging and sensors for measuring pulse/heart rate of the body (EX1006 6:14–20, 8:40–42), showing Honda's compatibility with Kotanagi. Thus, there is an express teaching in both references that the subject matter in each may be combined with the other. *See KSR* at 4. EX1003 ¶269.

Moreover, existing similarities between the main watch embodiments of Kotanagi and Honda would have caused a POSITA to expect success when combining features or inserting components from one into the other. Both have a

watch shape, both have biosensors, and both have a cover glass over an opening in the bottom face of the watch. For these reasons and those explained above, a POSITA would have been motivated to combine Honda and Kotanagi. EX1003 ¶270.

b. Motivation to Combine Coppola with Kotanagi and Honda

Ground 1 provides reasons for combining Kotanagi and Coppola. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with modifications to enable wireless charging as taught by Honda. Indeed, Honda itself teaches optical biosensors and wireless charging, in a similar-shaped watch device, so these three references are fully compatible. EX1003 ¶271.

c. Motivation to Combine Schmid with Kotanagi and Honda

Ground 2 provides reasons for combining Kotanagi and Schmid. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with modifications to enable wireless charging as taught by Honda. Indeed, Honda itself teaches optical biosensors and wireless charging, in a similar-shaped watch device, so these three references are fully compatible.

Thus, a POSITA would have combined Kotanagi's biometric watch with Honda's wireless charging structures in view of the teachings above. EX1003 ¶¶272–273.

N. Ground 7: Claim 8 is unpatentable because it would have been obvious over Kotanagi in view of Coppola or Schmid and further in view of Miller.

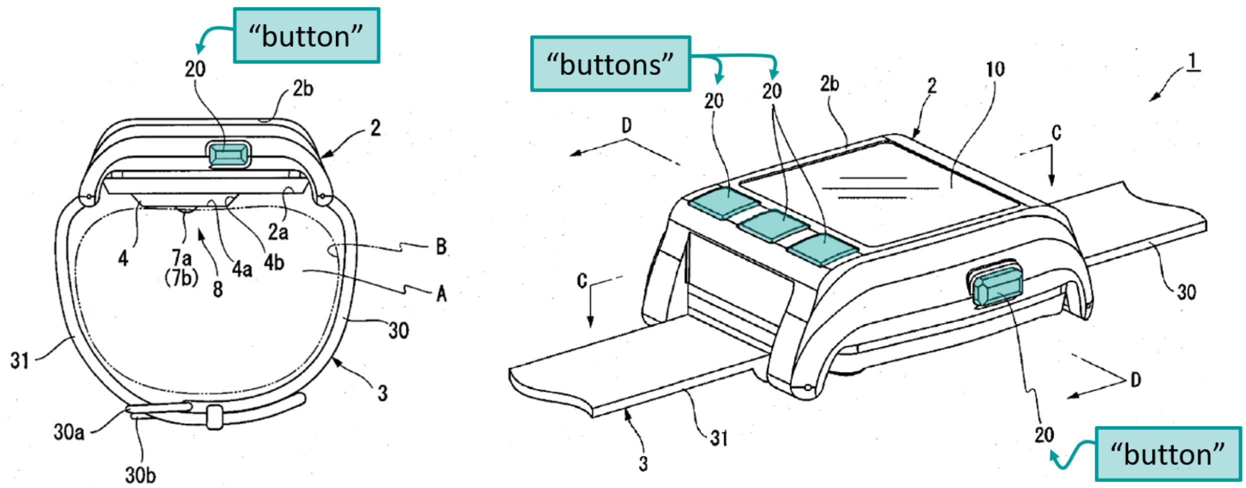
17. Dependent Claim 8

Claim 8 depends from Claim 1 and adds **"further comprising an input device positioned along a side of the housing and configured to receive a rotational input and a translational input."**

Grounds 1 and 2 both use Kotanagi to demonstrate how Claim 1 is unpatentable, but for the third (ECG) electrode and related teachings, Ground 1 uses Coppola and Ground 2 uses Schmid.

This Ground applies Kotanagi, Coppola, and Schmid identically to the analyses provided above for Claim 1 under both Grounds 1 and 2. However, it adds the teachings of Miller to Kotanagi for the further limitation of dependent Claim 8.

As discussed with respect to Claims 3 and 5 above, Kotanagi teaches buttons (20) including a push-button on the side of the watch that is "translated" (pushed).



See EX1005 at 24, 25 (Figs. 2 and 4). EX1003 ¶277.

Like Kotanagi, Miller teaches a watch with an input device ("crown 110") on the side:

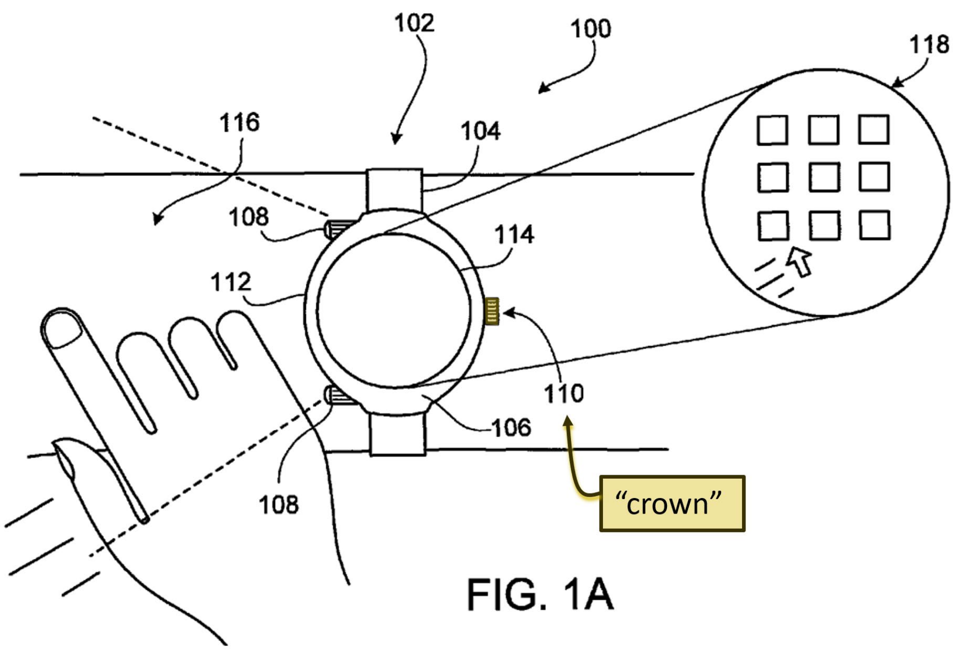


FIG. 1A

See EX1049 at 3. This crown is configured for rotational input (twisting) and translational input (pressing and pulling) for manipulating its touchscreen GUI:

> In some implementations, by ***pressing*** the crown 110, the user may toggle the computing device interface . . . In some implementations, the crown **110** may extend out from the device **102** and ***swivel*** about its axis . . . Sensors at the base of the crown 110 may be positioned to sense motion of the crown 110 in various directions, much like what occurs with a joystick input mechanism . . . . a user may extend the crown **110** and ***twist*** it to move between GUI applications.

EX1049 4:37–51 (emphasis added). EX1003 ¶¶278–279.

a. Motivation to Combine Kotanagi and Miller

In view of Kotanagi's use of side buttons (but with fewer movement modes) and the benefits described in Miller of both pressing and swiveling, a POSITA would have been motivated to combine Kotanagi and Miller to provide additional functionalities to its buttons, such as swiveling, twisting, toggling, or using the button like a joystick. EX1003 ¶280. Moreover, Miller's translating, swiveling crown is one of a limited number of known input options for a watch device, and it would have been obvious to replace at least one button of Kotanagi with Miller's crown. Such a substitution would have been a mere combination of familiar elements that do no more than yield predictable results. *See KSR* at 416.

b. Motivation to Combine Coppola with Kotanagi and Miller

Ground 1 provides reasons for combining Kotanagi and Coppola. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with modifications to enable rotating and translating buttons as taught by Miller. Indeed, by adding more movement modes to Kotanagi's side buttons, fewer such buttons are needed, leaving more room for the side electrode taught by Coppola. These three references are fully compatible. EX1003 ¶281.

c. Motivation to Combine Schmid with Kotanagi and Miller

Ground 2 provides reasons for combining Kotanagi and Schmid. Any modifications to Kotanagi in this process (e.g., adding a side ECG electrode), would not have interfered with modifications to enable rotating and translating buttons as taught by Miller. Indeed, by adding more movement modes to Kotanagi's side buttons, fewer such buttons are needed, leaving more room for the side electrode taught by Schmid. These three references are fully compatible.

For the reasons above, a POSITA would have added Miller's translating and rotating crown to Kotanagi's biometric watch, as modified by Coppola or Schmid to include a third ECG electrode on the side. EX1003 ¶¶282–283.

IV. SECONDARY CONSIDERATIONS, EVEN IF CONSIDERED, FAIL TO OVERCOME THE PRIMA FACIE EVIDENCE OF OBVIOUSNESS

Secondary considerations should be considered but do not control an obviousness conclusion under 35 U.S.C. § 103, particularly where, as here, a strong *prima facie* showing of obviousness exists. *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Petitioner is unaware of evidence of secondary considerations, and any such evidence could not outweigh the strong *prima facie* case of obviousness. Petitioner reserves the right to respond to any evidence of secondary considerations.

V. DISCRETIONARY FACTORS FAVOR INSTITUTION

With respect to 35 U.S.C. § 314(a), Fintiv factors 2, 3, 4, and 6 strongly favor institution of this IPR, and factors 1 and 5 are neutral. With respect to factor 2, the final written decision in this IPR is expected long before trial in the Delaware Litigation. Apple filed its complaint in the Delaware Litigation less than six months ago, on October 20, 2022, and the most recent published statistics indicate that the median time to trial for a civil action in the District of Delaware is almost three years. EX1048.

For factor 3, the parties and the court have made little investment in the Delaware Litigation. No infringement or invalidity contentions have been exchanged, claim construction briefing has not started, and initial written discovery is in its early stages.

For factor 4, Petitioner stipulates that, if the Board institutes this IPR, Petitioner will not pursue, in the Delaware Litigation, the specific invalidity grounds for the challenged claims raised in this Petition or that reasonably could have been raised in this Petition. This stipulation "mitigates any concerns of duplicative efforts between the district court and the Board," and, thus, factor 4 "weighs strongly in favor of not exercising discretion to deny institution." *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential as to § II.A).

For factor 6, this Petition presents a compelling case of unpatentability of the challenged claims. For factor 1, Petitioner has not moved for a stay of the Delaware Litigation but may do so upon institution of an IPR. For factor 5, Petitioner Masimo is a defendant in the Delaware Litigation. In view of all circumstances, the judicial and administrative efficiency considerations underlying *Fintiv* are not implicated here. Therefore, the Board should institute this IPR.

With respect to Section 325(d), this Petition presents the first *inter partes* challenge to the '483 patent and none of the references the Petition relies on in the Grounds were considered during examination. Further, the references relied on herein are materially better than the references considered during examination because, as shown above, they disclose every limitation of the independent claims, including ECG electrodes on various surfaces of a biosensing watch, a touchscreen display, a rear sapphire cover, wireless charging, and other features. Therefore, this Petition presents new prior art and new patentability arguments that have never previously been before the Office.

VI. CONCLUSION

Petitioner respectfully requests that the Board institute an IPR and cancel claims 1–20 of the '483 patent under 35 U.S.C. § 103.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: April 4, 2023

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CERTIFICATE OF TYPE-VOLUME LIMITATIONS UNDER 37 C.F.R. § 42.24

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,474,483**, exclusive of the parts exempted as provided in 37 C.F.R. § 42.24(a), contains 12,232 words and therefore complies with the type-volume limitations of 37 C.F.R. § 42.24(a).

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: April 4, 2023

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CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,474,483** and **EXHIBITS 1001–1012, 1014, 1016, 1020, 1022–1023. 1025–1031, 1033–1039, 1041, 1047–1049** are being served on April 4, 2023, via Federal Express overnight delivery on counsel of record for U.S. Patent No. 11,474,483 as addressed below:

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